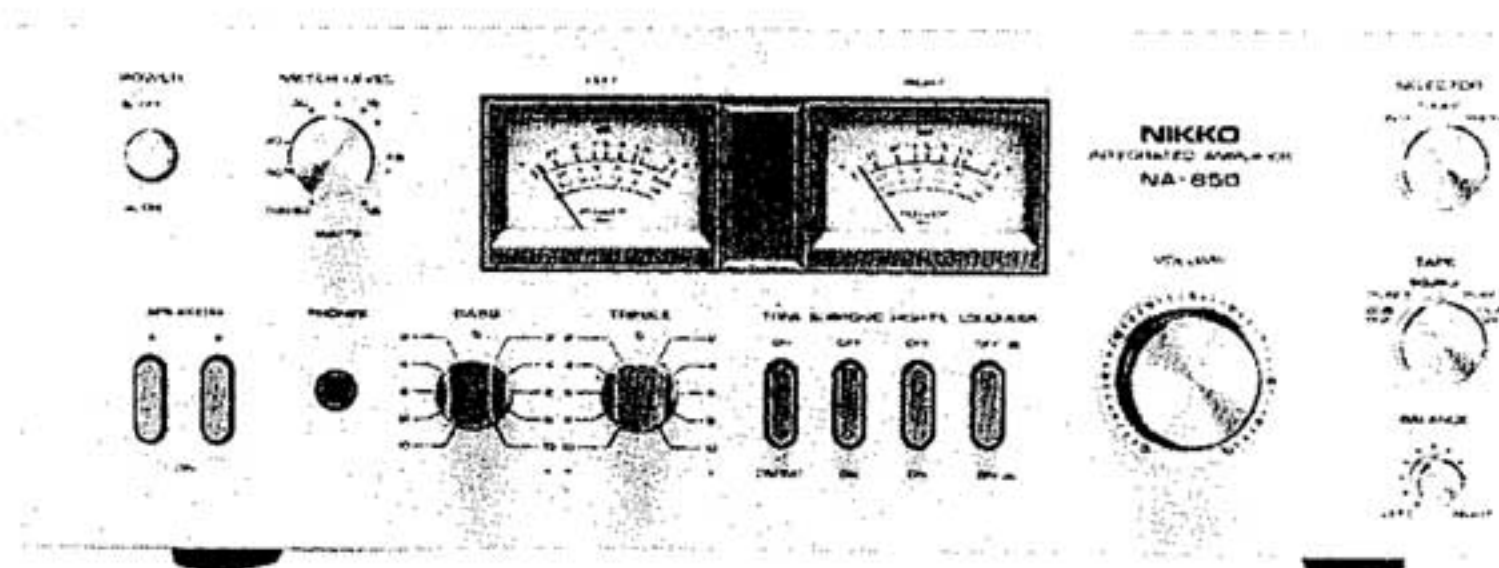




For more Hi-Fi manuals and set-up information
please visit www.hifiengine.com

INTEGRATED AMPLIFIER

NA-850

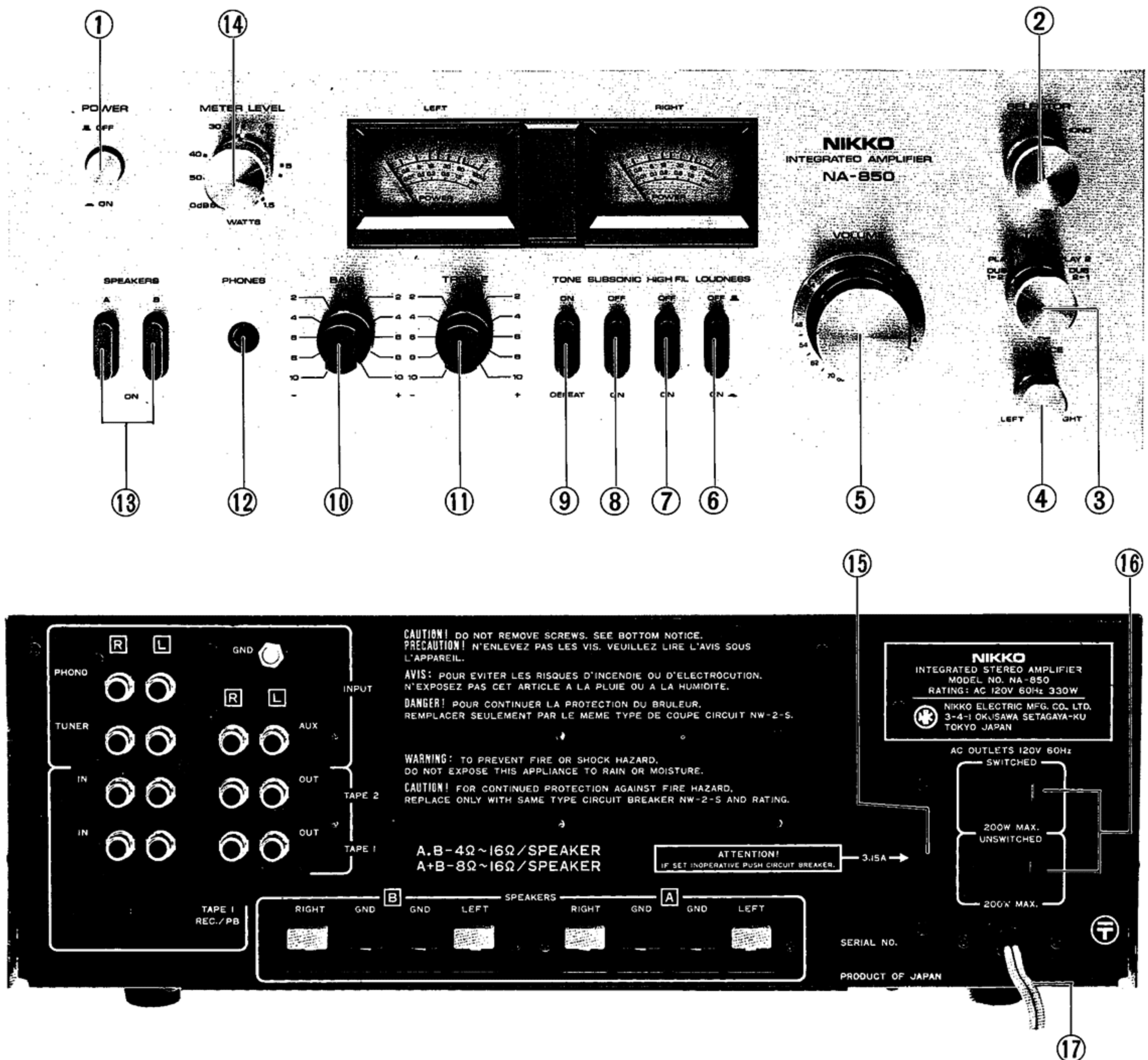


SERVICE MANUAL

TYPE AND VOLTAGE

W-TYPE UL and CSA type	120V AC
E-TYPE europe standard (universal) type	100/120/220/240V AC
N-TYPE DEMKO and SEMKO type	220/240V AC

NIKKO



- | | |
|---------------------------|------------------------------|
| 1. POWER SWITCH | 10. BASS CONTROL |
| 2. SELECTOR SWITCH | 11. TREBLE CONTROL |
| 3. TAPE SWITCH | 12. HEADPHONES JACK |
| 4. BALANCE CONTROL | 13. SPEAKERS SELECTOR SWITCH |
| 5. VOLUME CONTROL | 14. METER LEVEL CONTROL |
| 6. LOUDNESS SWITCH | 15. CIRCUIT BREAKER |
| 7. HIGH CUT FILTER | 16. AC OUTLETS |
| 8. SUBSONIC FILTER SWITCH | 17. AC LINE CORD |
| 9. TONE DEFEAT SWITCH | |

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SPECIFICATIONS

	UNIT	NOMINAL	LIMIT
Continuous Power Output per channel, 8 ohm loads:			
20Hz — 20kHz @0.08%THD	.watts.	.65	.60
1kHz @ 0.08%THD.	.watts.	.70	.60
TH Distortion, 8 ohm loads, 20Hz —20kHz:			
@Continuous Power Output	%		< 0.08
@1 watt Power Output.	%		< 0.035
IM Distortion, 8 ohm loads:			
@Continuous Power Output	%		< 0.08
@1 watt Power Output.	%		< 0.035
IHF Power Bandwidth, 8 ohm loads	.Hz — kHz.	.5 — 50.	10 — 30
Damping Factor, 8 ohm loads, @ 1kHz		.60	.40
Frequency Response, 8 ohm loads:			
PHONO → TAPE OUT (RIAA).	.dB@Hz — kHz		< ±1 @ 30 — 15
AUX, TAPE IN → SP. TER.	.dB@Hz — kHz		< ±2 @ 10 — 50
Input Sensitivity for 60 watts Power Output, @ 1kHz:			
PHONO.	.mV.	.25	.25±2dB
TUNER, AUX, TAPE IN, DIN CONNECTOR.	.mV.	.160.	160±2dB
Maximum Input before Overload Distortion, @1kHz:			
PHONO 0.1%THD	.mV.	.220.	220±2dB
Output Level for 2.5mV Input, @1kHz:			
PHONO → TAPE OUT	.mV.	.160.	160±2dB
PHONO → DIN CONNECTOR.	.mV.	.30	30±2dB
Hum and Noise (IHF)			
PHONO.	.dB	.65	.60
TUNER, AUX, TAPE IN, DIN CONNECTOR.	.dB	.85	.80
Tone Control:			
BASS	.dB@70Hz	±12	±12±2dB
TREBLE	.dB@10kHz.	±10	±10±2dB
Loudness Control (VOLUME: —30dB)			
70Hz.	.dB@70Hz	+8	+8±2dB
10kHz.	.dB@ 10kHz.	+6	+6±2dB
Low Cut Filter	.dB@15Hz	—3	—3±2dB
High Cut Filter	.dB@10kHz.	—6	—6±2dB
Idling Current.	.mA.	.20	.20 ⁺²⁰ _{—10} mA
Midpoint Voltage	.mV.	.0	.0±50mV
Power Switch Muting Delay Time.	.second.	.5	.5±3 second
Protect Circuit Input Sensitivity.	.DC, V	±3	±2

DISASSEMBLY

NOTE: Three digit numbers circled () in this chapter are represented by a (★) in the parts listing.

CABINET COVER REMOVAL

Remove seven tapping screws from the top and both sides of the metal cover as shown in photo 1. To reassemble, reverse the procedure.

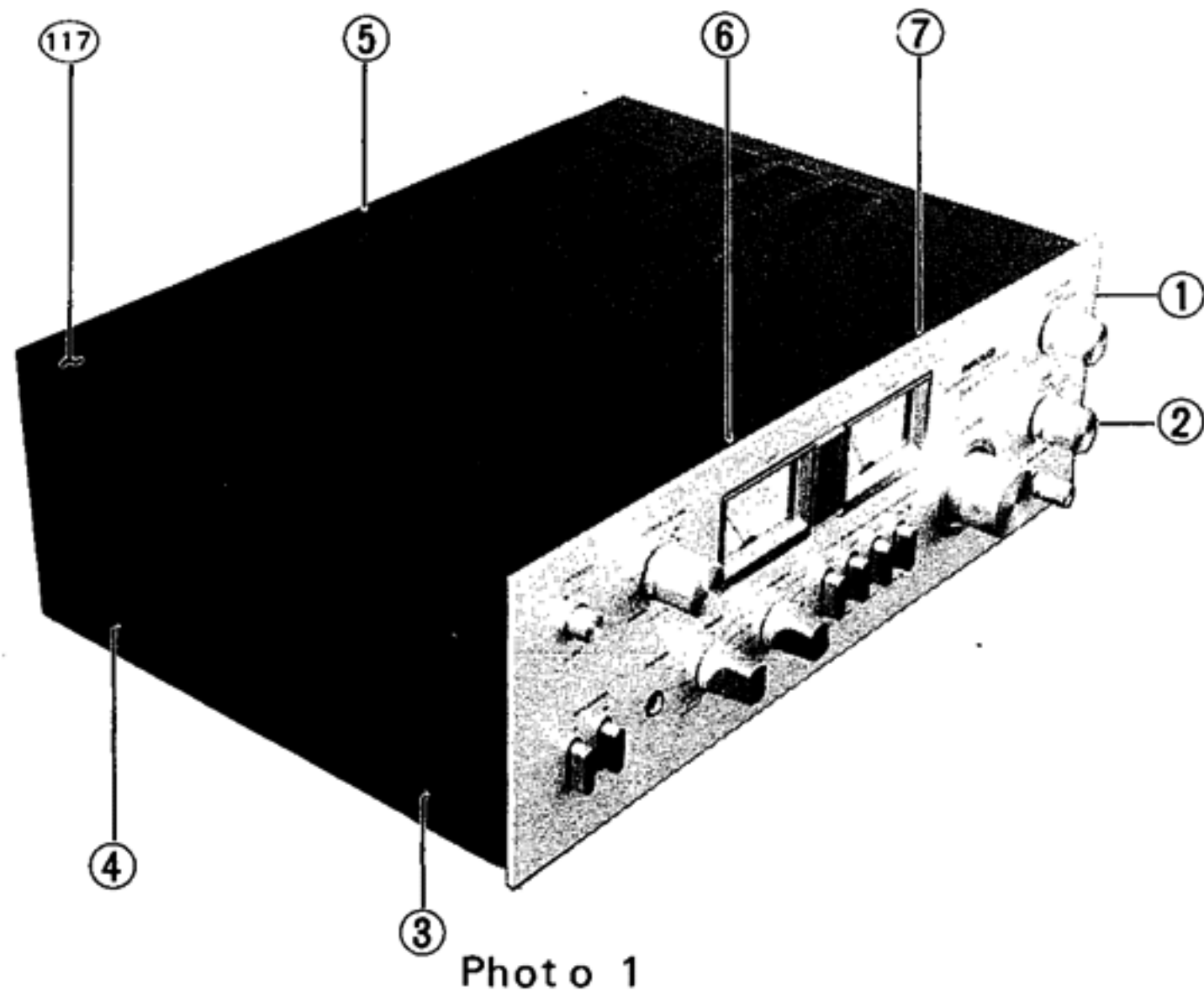


Photo 1

BOTTOM PLATE REMOVAL

Remove four tapping screws from the bottom of the unit and lift away.

FRONT PANEL REMOVAL

1. Remove seven knobs (VOLUME, SELECTOR, TAPE, METER LEVEL, BALANCE, BASS and TREBLE) from the front panel.
2. Remove three nuts (1–3) (photo 2) and three tapping screws (1–3) (photo 3) and lift the panel away from the unit.
—To reassemble, reverse the procedure.

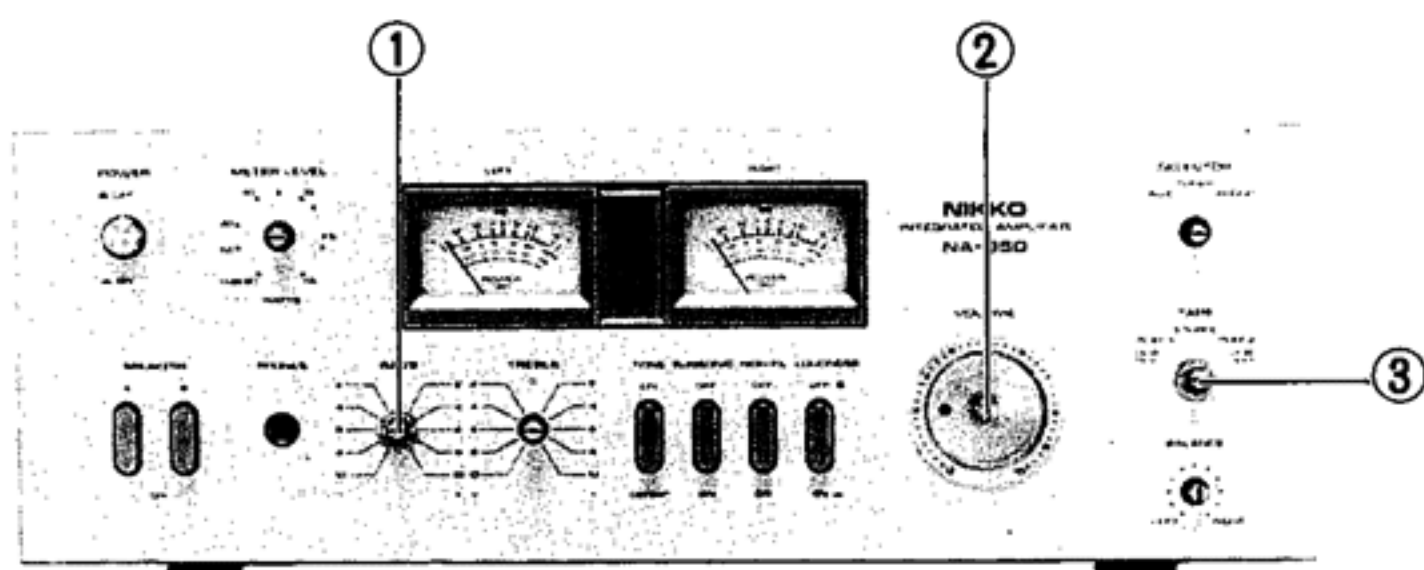


Photo 2

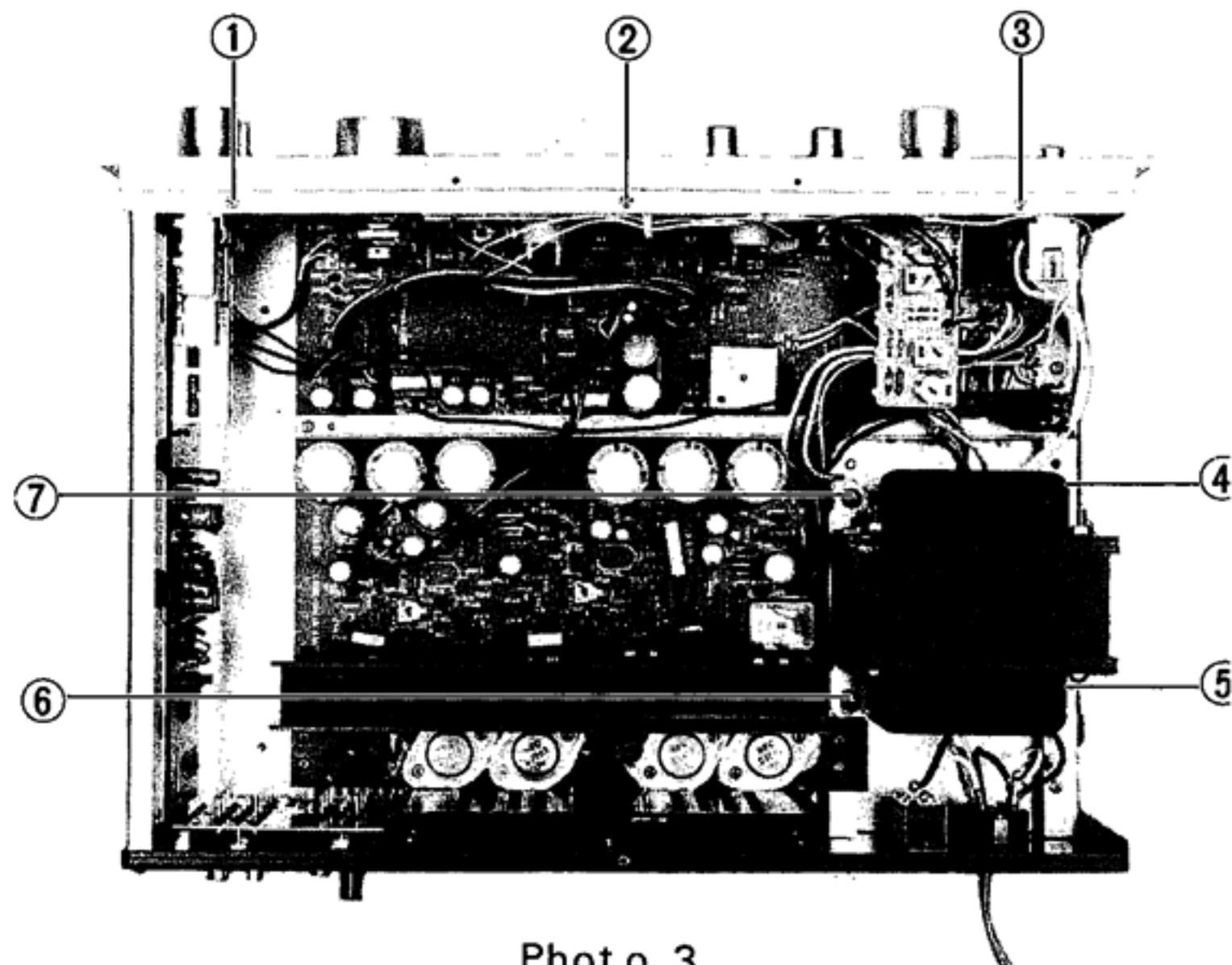


Photo 3

POWER TRANSFORMER REMOVAL

1. Remove four tapping screws (4–7) (photo 3).
2. Lift Power Transformer up and out of chassis.
—To reassemble, reverse the procedure.

METER REMOVAL

1. Two meters are held by a "meter bracket". Remove the two tapping screws (1 and 4) (photo 4) from the bracket.
2. Disconnect all cables connecting to the meters before lifting them out.
—To reassemble, reverse the procedure.

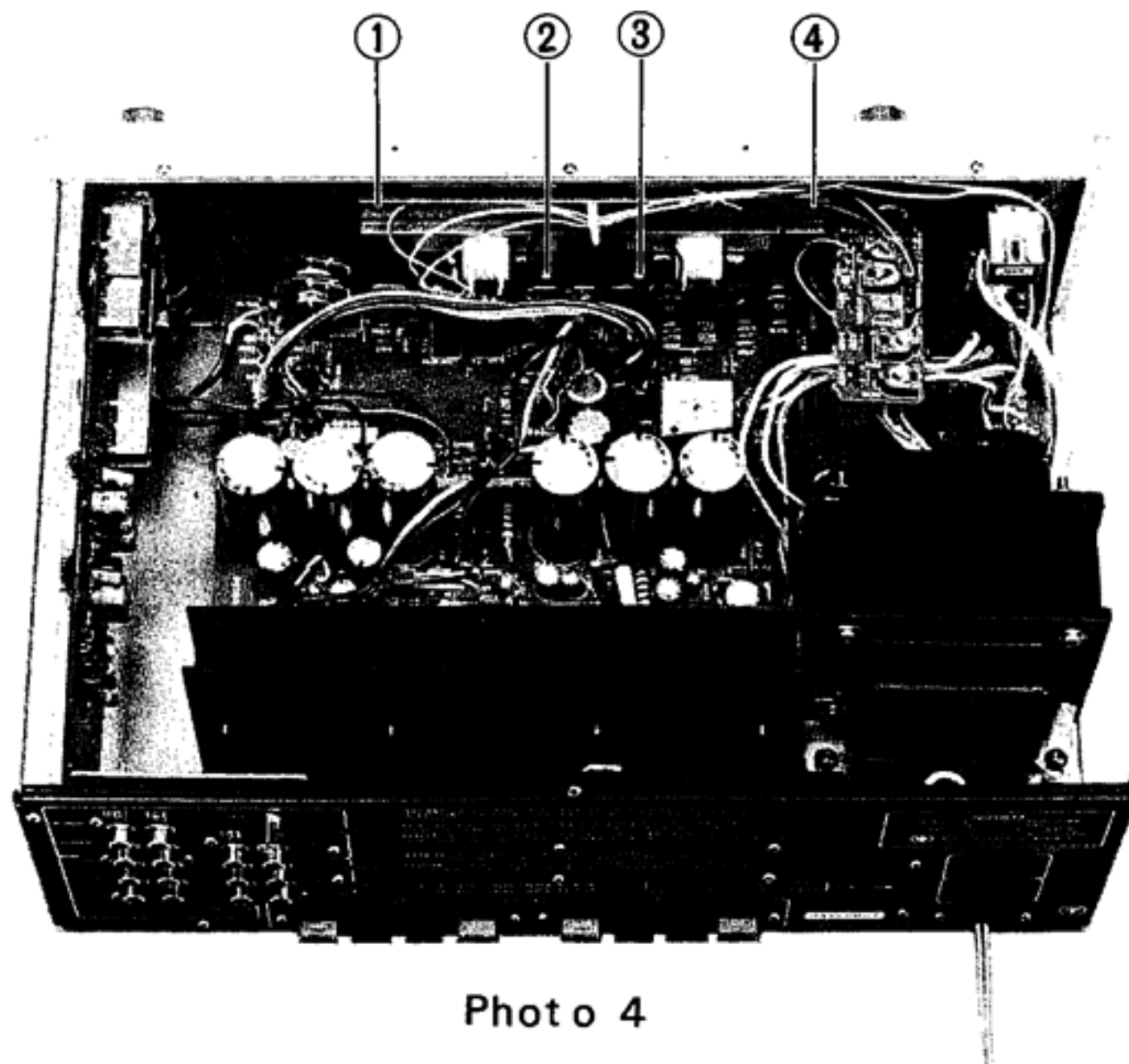
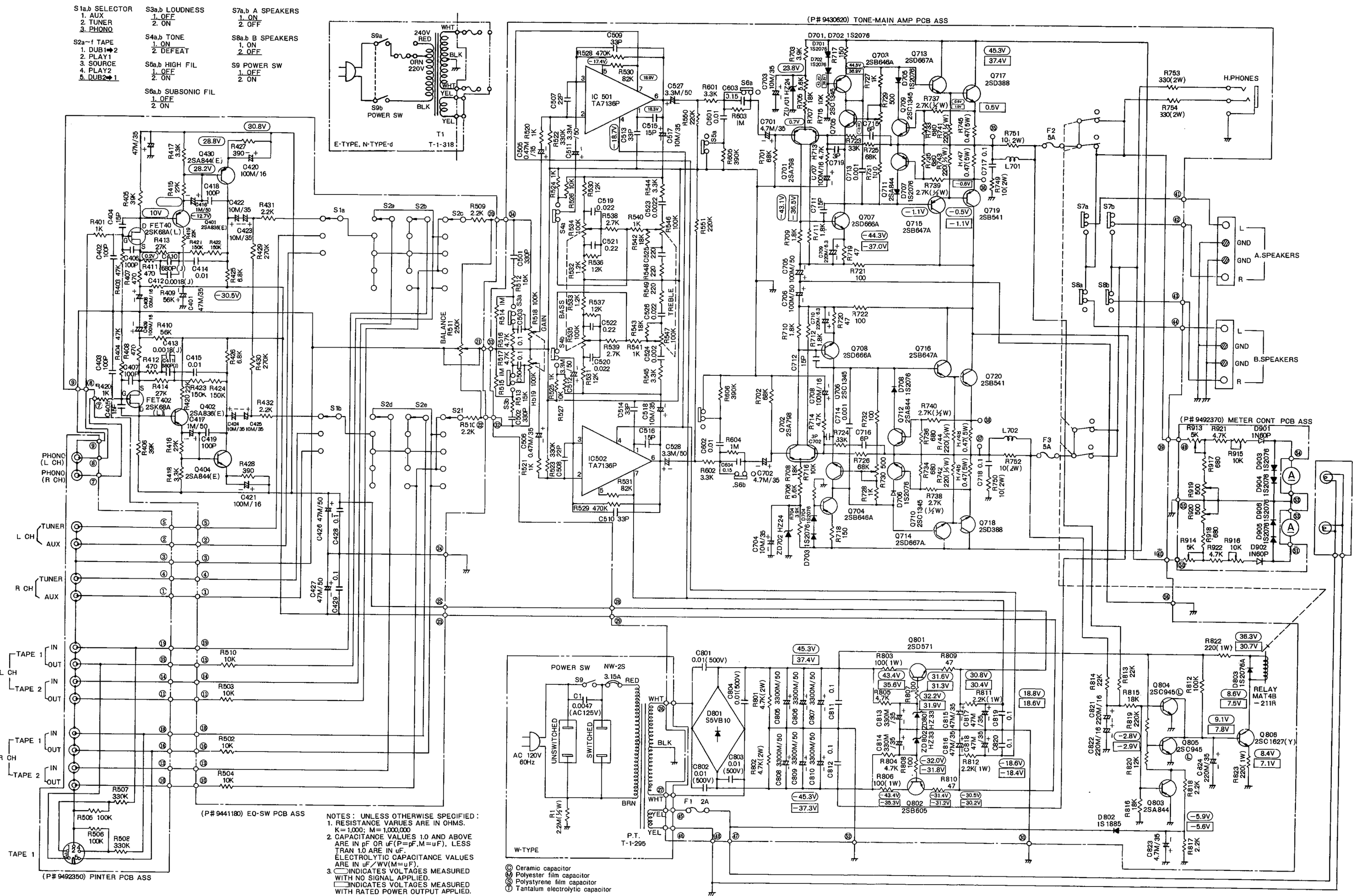


Photo 4

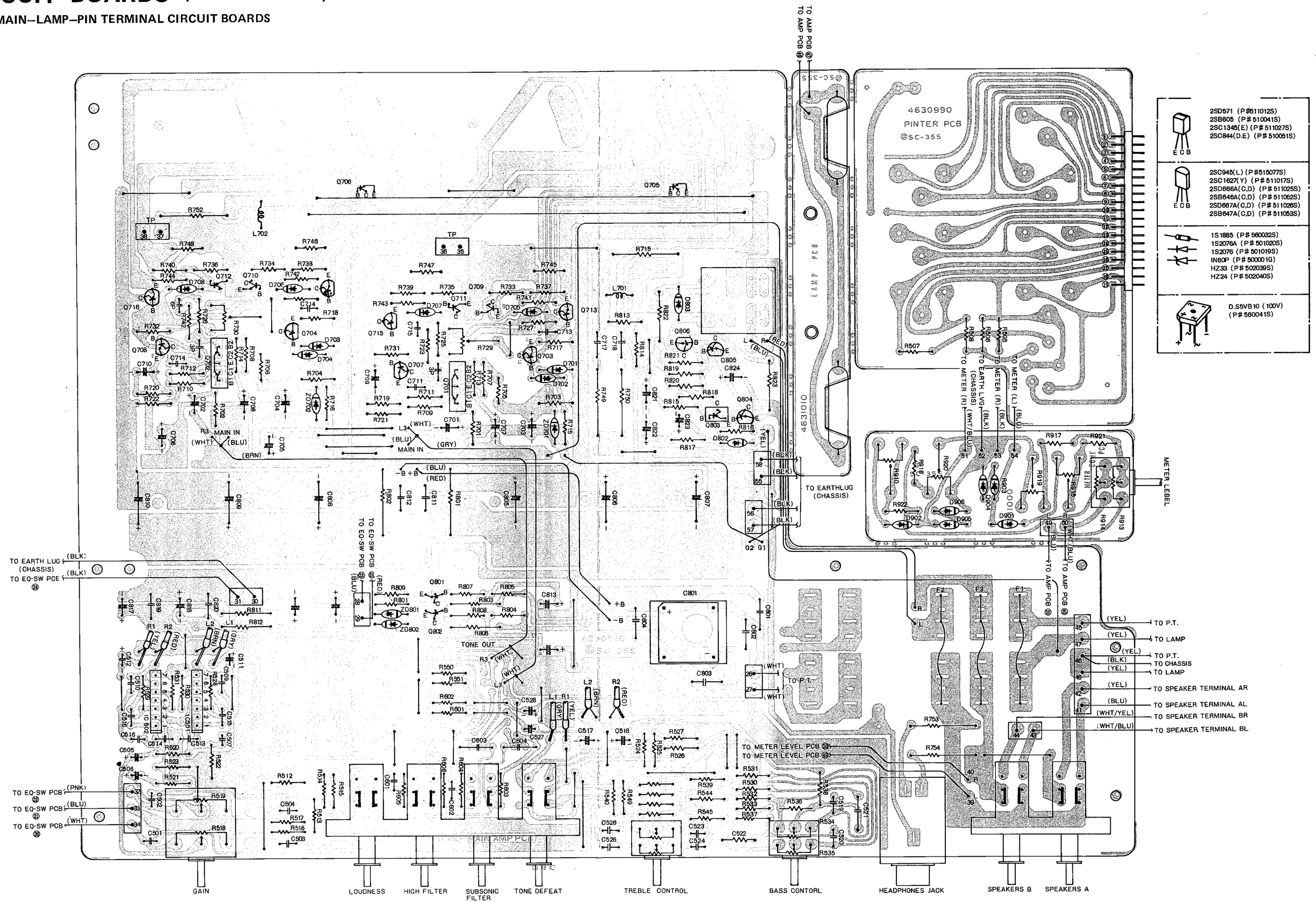
LAMP REPLACEMENT

1. Remove two tapping screws (2 and 3) (photo 4) and lift the lamp circuit board.
2. Use soldering iron to remove lamps.
—To reassemble, reverse the procedure.

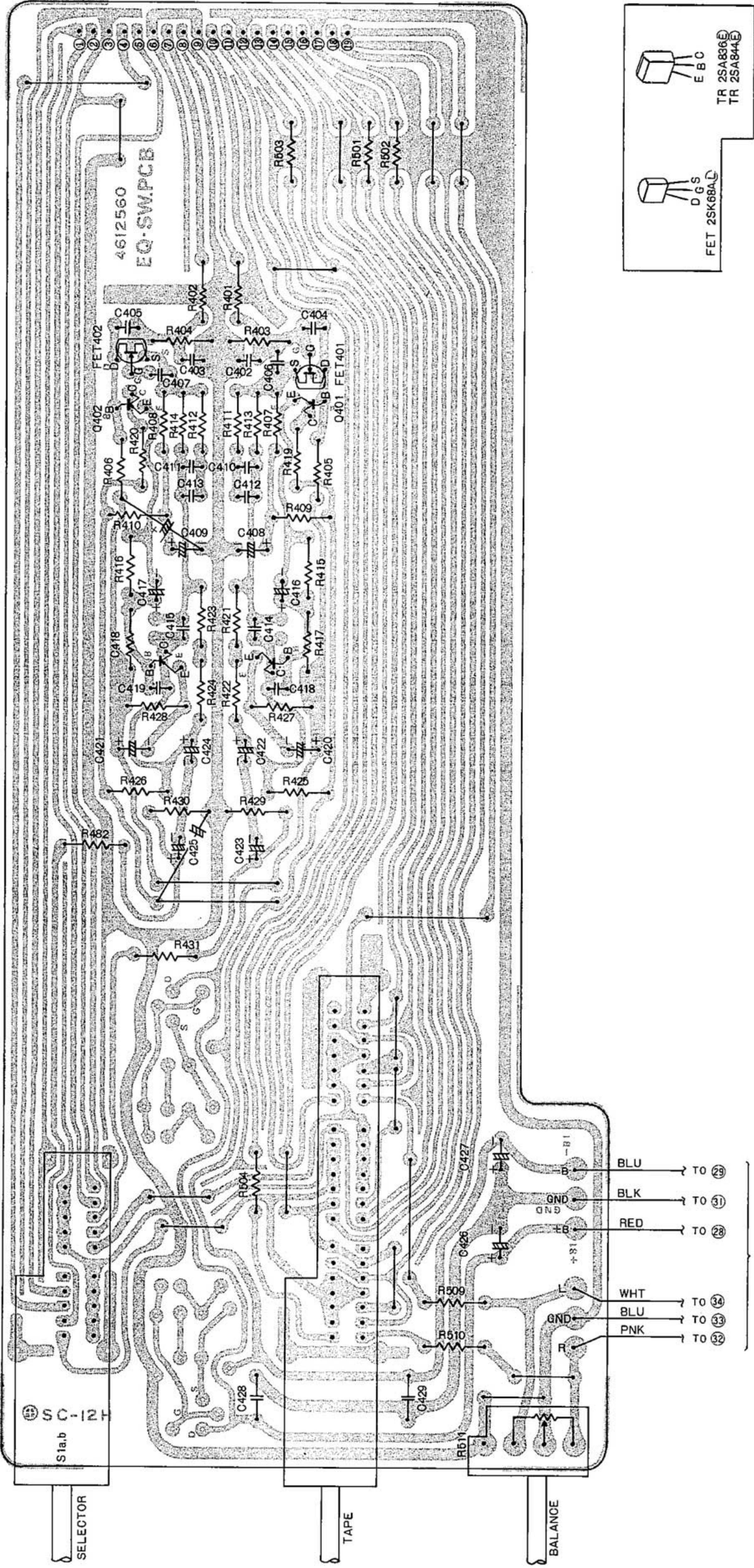
SCHEMATIC DIAGRAM



TONE/MAIN-LAMP-PIN TERMINAL CIRCUIT BOARDS



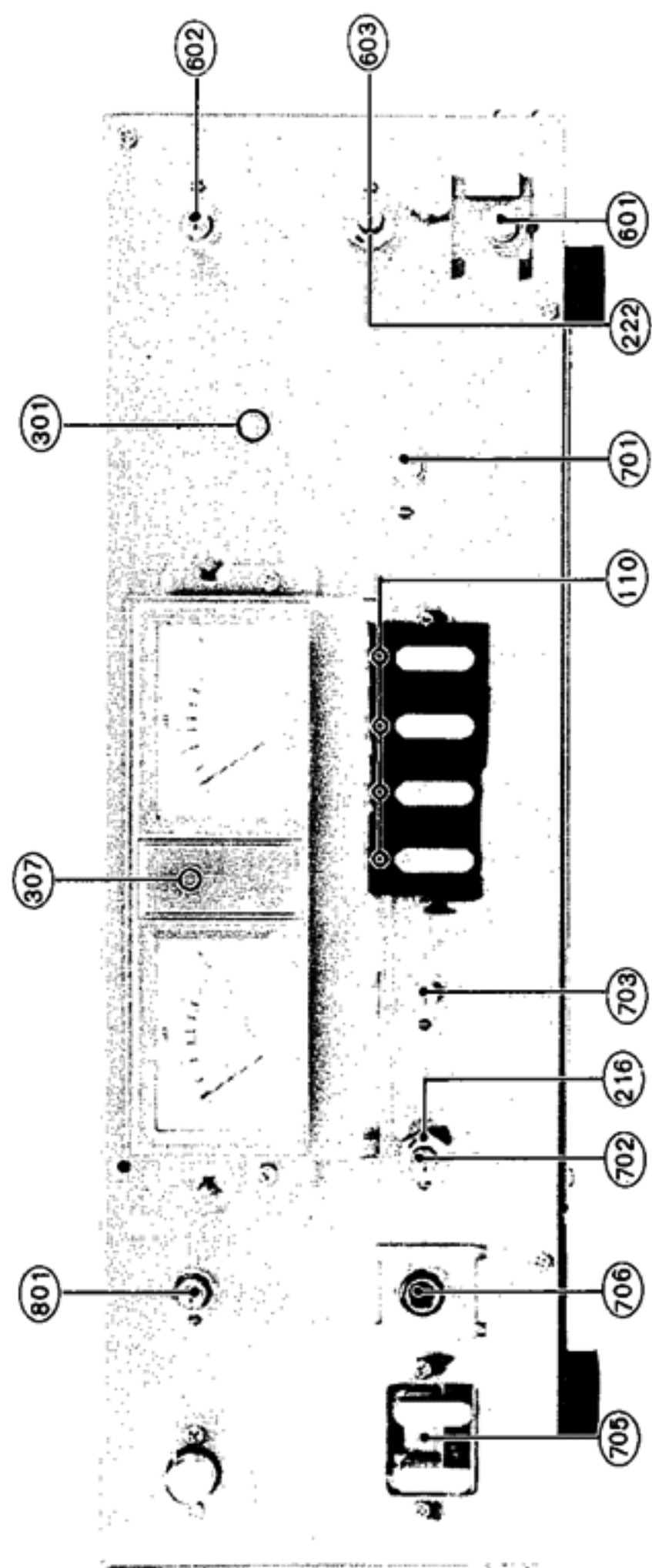
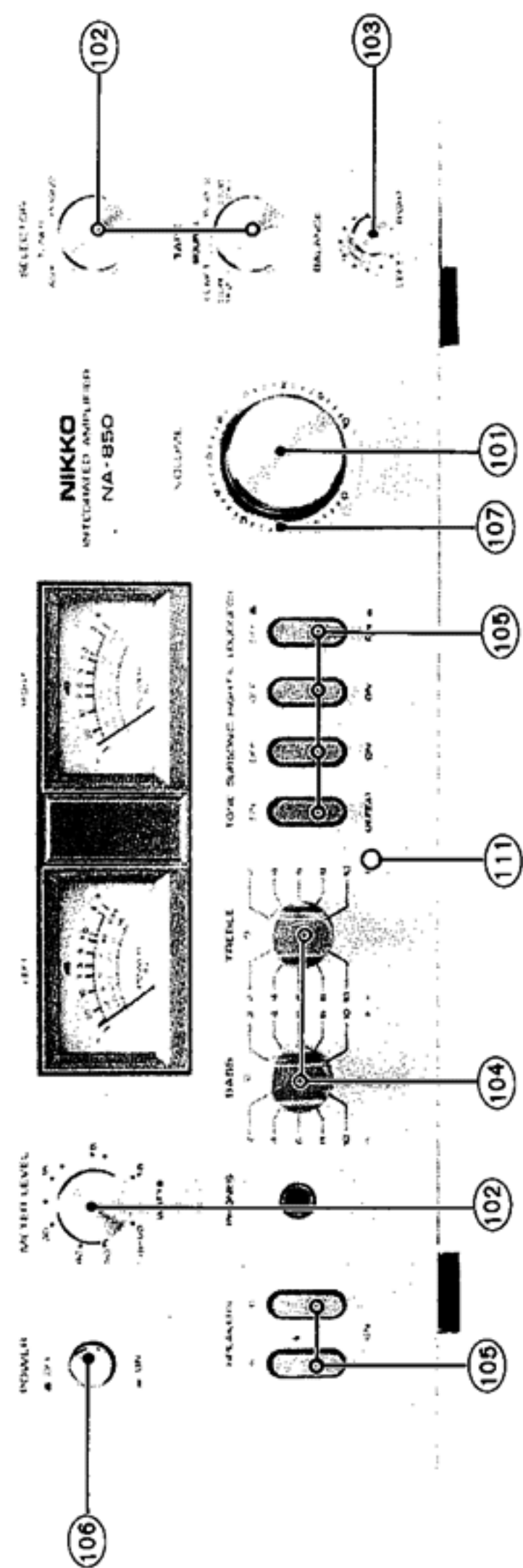
EQUALIZATION/SWITCH CIRCUIT BOARD



FET 2SK68A

TR 2SA836E

TR 2SA844E



PARTS LIST

NOTES

- ★ The KEY NUMBER (#) marked with a (★) on parts list relate to numbers of three digits with a (○). (photo 1-8).
- + Numbers in file indicate the quantity of parts used in one type.
- ++ TR: Transistor
FET: Field effect transistor
IC: Integrated circuit
VR: Volume control (Variable resistor)
RES: Carbon film fixed resistor
MO-RES: Metal oxide film fixed resistor
CEM-RES: Cemented wire-wound fixed resistor
FP: Flame proof
C-CAP: Ceramic capacitor
E-CAP: Aluminium electrolytic capacitor
M-CAP: Polyester film capacitor

S-CAP: Polystyrene film capacitor
T-CAP: Tantalum electrolytic capacitor
BP-CAP: Bipolar electrolytic capacitor

E-CAP, T-CAP and BP-CAP values (1x10uF) are in (1)uF, (10)V.

- Assemblies and parts are subject to change without notice.
- Parts ordering procedure:
Include in any order
a. part number.
b. Part description.
c. Model number.
(any of the above lacking from an order may delay shipment of the order.)

KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.
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PACKING MATERIALS & ACCESSORIES

001		1 1 1	CARTON BOX	9825220
002		2 2 2	STYROL PAD	9840640
003		1 1 1	POLY SACK—vinyl cloth back	9640550
004		1 1 1	POLY SACK #13—vinyl cloth back	9640320
005a		1 — —	INSTRUCTION MANUAL E	960196E
005b			INSTRUCTION MANUAL F	960211F
005c		— 1 1	INSTRUCTION MANUAL K	960189K
006		1 — —	WARRANTY CARD (N)	967003A
007		1 1 1	POLISHING CLOTH	9690040
008		1 1 1	SILICA GEL—dryer	9690010

CABINET ASSEMBLY

★101		1 1 1	KNOB R15GL-33D (volume)	7851640
★102		3 3 3	KNOB R15GL-22D (selector, tape, meter level)	7851610
★103		1 1 1	KNOB R15GL-12D (balance)	7851620
★104		2 2 2	KNOB 8GL-20LVD (bass, treble)	7851650
★105		6 6 6	PUSHBUTTON ABS (speakers, loudness, high filter) (subsonic, tone)	7851560
★106		1 1 1	PUSHBUTTON M12-GL 3.3SQ (power)	7850620
★107		1 1 1	VR RING 47	7883530
108	↑	1 1 1	SN 8 φ—nut	892248S
109	↑	1 1 1	W 8 φ—washer	893108S
★110		4 4 4	DUST COVER (S)	7001880
★111		1 1 1	PNL NA-850 — front panel	7883570
112	↑	3 3 3	PUSHBUTTON GUIDE (2)	7401210
113	↑	1 1 1	PUSHBUTTON GUIDE 12B	7400630
114	↑	3 3 3	PTS 3 φ x 8 BLK—screw	814308S
115	↑	2 2 2	SN 9 φ—nut	892249S
116	↑	2 2 2	W 9 φ—washer	893109S
★117		1 1 1	METAL COVER	7820770
★118		3 3 3	PTS 3 φ x 8 BLK—screw	814308Q
★119		4 4 4	TFTS 4 φ x 10 BLK—screw	887410W
★120		4 4 4	W 5 φ BLK—screw	893105W
★121		1 1 1	BTM PLT—bottom plate	7324530
★122	↑	4 4 4	PTS 3 φ x 6—screw	814306S
123		4 4 4	POLY FOOT 23 φ x 12—foot	7401080
124	↑	4 4 4	PTS 3 φ x 12—screw	814312S

KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.
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CHASSIS ASSEMBLY

201		1 1 1	CHASSIS (L)	7324540
202		1	EARTH LUG	4400000
203	↑	1	TW(1) 3 φ—washer	893403U
204	↑	1	PTS 3 φ x 6—screw	814306S
205	R1	1	RES 2.2M ohm 10% 1/2W	315225K
206		1	EARTH LUG 4P WP	4400100
207	↑	1	PTS 3 φ x 6—screw	814306S
208		1 1 1	WIRE CLIP 43	7401340
★209a		1 — —	POWER TRANSFORMER T-1-295 120V	1102950
209b		— —	POWER TRANSFORMER T-1-316 100/120/220/240V	1103160
209c		— 1	POWER TRANSFORMER T-1-318 220/240V	1103180
210	↑	4 4 4	BLTS 4 φ x 8—screw	874408S
211		1 1 1	CHASSIS (R)	7324550
212	1	6 6 6	PTS 3 φ x 6—screw	814306S
(700)			(FRONT PLATE ASSEMBLY)	
213	↑	4 4 4	PMS 3 φ x 5—screw	810305S
214	↑	6 6 6	PTS 3 φ x 8—screw	814308S
215	↑	1 1 1	W 3 φ—washer	893203D
★216	↑	1 1 1	SPCR 765—spacer	7152210
217	↑	1 1 1	PCB ANGLE	893107S
218	↑	6 6 6	PTS 3 φ x 8—screw	814308S
219	↑	8 8 8	PTS 3 φ x 8—screw	814308S
220	↑	6 6 6	BLTS 3 φ x 8—screw	874308S
221	↑	4 4 4	PTS 3 φ x 10—screw	814310S
(600)			(EQ/SW PCB ASS)	
★222	↑	1 1 1	SPCR 765—spacer	7152210
223	↑	2 2 2	ANGLE	7226050
224	↑	4 4 4	PTS 3 φ x 8—screw	814308S

FRONT PLATE ASSEMBLY

★301		1 1 1	FRONT PLATE	7324560
(800)			(METER CONTROL PCB ASS)	
★302a	S9	1 — —	PUSHBUTTON SWITCH SDG-1P (power)	4040820

PART ORDERING PROCEDURE ----- Include in any order: A. Part number, B. Part description, C. Model number.
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KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.	KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.
	R420	1 1 1	RES 22kohm 5% 1/4W	328223J		C601	1 1 1	M-CAP 0.01uF 10% 50V	222103K
	R421	1 1 1	RES 150kohm 5% 1/4W	328154J		C602	1 1 1	M-CAP 0.01uF 10% 50V	222103K
	R422	1 1 1	RES 150kohm 5% 1/4W	328154J		C603	1 1 1	M-CAP 0.15uF 10% 50V	222154K
	R423	1 1 1	RES 150kohm 5% 1/4W	328154J		C604	1 1 1	M-CAP 0.15uF 10% 50V	222154K
	R424	1 1 1	RES 150kohm 5% 1/4W	328154J					
	R425	1 1 1	RES 6.8kohm 5% 1/4W	328682J		IC501	1 1 1	IC TA3176P	518045S
	R426	1 1 1	RES 6.8kohm 5% 1/4W	328682J		IC502	1 1 1	IC TA3176P	518045S
	R427	1 1 1	RES 390ohm 5% 1/4W	328391J					
	R428	1 1 1	RES 390ohm 5% 1/4W	328391J		R512	1 1 1	RES 15kohm 5% 1/4W	328153J
	R429	1 1 1	RES 270kohm 5% 1/4W	328274J		R513	1 1 1	RES 15kohm 5% 1/4W	328153J
	R430	1 1 1	RES 270kohm 5% 1/4W	328274J		R514	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R431	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R515	1 1 1	RES 1Mohm 5% 1/4W	328105J
	R432	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R516	1 1 1	RES 4.7kohm 5% 1/4W	328472J
						R517	1 1 1	RES 4.7kohm 5% 1/4W	328472J
	R501	1 1 1	RES 10kohm 5% 1/4W	328103J	★701	R518,			
	R502	1 1 1	RES 10kohm 5% 1/4W	328103J		R519	1 1 1	VR, V24L5G5PHN25KC15AL, 100kohmX2(41PC)(volume)	4320650
	R503	1 1 1	RES 10kohm 5% 1/4W	328103J					
	R504	1 1 1	RES 10kohm 5% 1/4W	328103J		R520	1 1 1	RES 1kohm 5% 1/4W	328102J
						R521	1 1 1	RES 1kohm 5% 1/4W	328102J
	R509	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R522	1 1 1	RES 330kohm 5% 1/4W	328334J
★601	R510	1 1 1	RES 2.2kohm 5% 1/4W	328222J		R523	1 1 1	RES 330kohm 5% 1/4W	328334J
	R511	1 1 1	VR V16L4(PH)N30KC5BM250K (C,C) 250kohm (balance)	4310510		R524	1 1 1	RES 1kohm 5% 1/4W	328102J
★602	S1	1 1 1	ROTARY SLIDE SWITCH (selector)	4055120		R525	1 1 1	RES 1kohm 5% 1/4W	329102J
★603	S2	1 1 1	ROTARY SLIDE SWITCH SRZ-V065N (tape)	4055060		R526	1 1 1	RES 10kohm 5% 1/4W	329103J
						R527	1 1 1	RES 10kohm 5% 1/4W	328103J
						R528	1 1 1	RES 470kohm 5% 1/4W	328474J
						R529	1 1 1	RES 470kohm 5% 1/4W	328474J
						R530	1 1 1	RES 12kohm 5% 1/4W	328123J
						R530	1 1 1	RES 82kohm 5% 1/4W	328823J
						R530	1 1 1	RES 12kohm 5% 1/4W	328123J
						R531	1 1 1	RES 82kohm 5% 1/4W	328823J
						R532	1 1 1	RES 1.2kohm 5% 1/4W	328122J
						R533	1 1 1	RES 1.2kohm 5% 1/4W	328122J
					★702	R534,			
						R535	1 1 1	VR, V16L4G3PHN25KC26Z, 100kohmX2(11PC)(bass)	4320660
						R536	1 1 1	RES 12kohm 5% 1/4W	328123J
						R537	1 1 1	RES 12kohm 5% 1/4W	328123J
						R538	1 1 1	RES 2.7kohm 5% 1/4W	328272J
						R539	1 1 1	RES 2.7kohm 5% 1/4W	328272J
						R540	1 1 1	RES 1kohm 5% 1/4W	328102J
						R541	1 1 1	RES 1kohm 5% 1/4W	328102J
						R542	1 1 1	RES 18kohm 5% 1/4W	328183J
						R543	1 1 1	RES 18kohm 5% 1/4W	328183J
						R544	1 1 1	RES 3.3kohm 5% 1/4W	328332J
						R545	1 1 1	RES 3.3kohm 5% 1/4W	328332J
					★703	R546,			
						R547	1 1 1	VR, V16L4G3PHN25KC26Z, 100kohmX2(11PC)(treble)	4320660
						R548	1 1 1	RES 220ohm 5% 1/4W	328221J
						R549	1 1 1	RES 220ohm 5% 1/4W	328221J
						R550	1 1 1	RES 220kohm 5% 1/4W	328224J
						R551	1 1 1	RES 220kohm 5% 1/4W	328224J
	C501	1 1 1	S-CAP 330pF 10% 50V	223331W		R601	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	C502	1 1 1	S-CAP 330pF 10% 50V	223331W		R602	1 1 1	RES 3.3kohm 5% 1/4W	328332J
	C503	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R603	1 1 1	RES 1Mohm 5% 1/4W	328105J
	C504	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R604	1 1 1	RES 1Mohm 5% 1/4W	328105J
	C505	1 1 1	T-CAP 35D 0.47uF	252405M		R605	1 1 1	RES 390kohm 5% 1/4W	328394J
	C506	1 1 1	T-CAP 35D 0.47uF	252405M	★703	R606	1 1 1	RES 390kohm 5% 1/4W	328394J
	C507	1 1 1	C-CAP 22pF 10% 50V SL	232220K					
	C508	1 1 1	C-CAP 22pF 10% 50V SL	232220K					
	C509	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C510	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C511	1 1 1	E-CAP 50R3.3uF LC	211513L					
	C512	1 1 1	E-CAP 50R3.3uF LC	211513L					
	C513	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C514	1 1 1	C-CAP 33pF 10% 50V SL	232330K					
	C515	1 1 1	C-CAP 15pF 10% 50V SL	232150K					
	C516	1 1 1	C-CAP 15pF 10% 50V SL	232150K					
	C517	1 1 1	E-CAP 35R10uF LC	211420L					
	C518	1 1 1	E-CAP 35R10uF LC	211420L					
	C519	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C520	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C521	1 1 1	M-CAP 0.22uF 10% 50V	222224K					
	C522	1 1 1	M-CAP 0.22uF 10% 50V	222224K	★704	S3-S6	1 1 1	TETRA PUSH SW SUE-43 (loudness, high-fil, tone, subsonic fil) — quadruple pushbutton switch	4040880
	C523	1 1 1	M-CAP 0.0022uF 10% 50V	222222K					
	C524	1 1 1	M-CAP 0.0022uF 10% 50V	222222K	★705	S7,S8	1 1 1	TWIN PUSH SW (A speakers, B speakers) — double pushbutton switch	4040930
	C525	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C526	1 1 1	M-CAP 0.022uF 10% 50V	222223K					
	C527	1 1 1	E-CAP 50R3.3uF LC	211513L					
	C528	1 1 1	E-CAP 50R3.3uF LC	211513L					

PART ORDERING PROCEDURE ----- Include in any order: A. Part number, B. Part description, C. Model number.
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.	KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.
(POWER AMP SECTION)					R701		1 1 1	RES 68kohm 5% 1/4W	328683J
C701		1 1 1	E—CAP 35R4.7uF LC	211415L	R702		1 1 1	RES 68kohm 5% 1/4W	328683J
C702		1 1 1	E—CAP 35R4.7uF LC	211415L	R703		1 1 1	RES 3.9kohm 5% 1/4W	328392J
C703		1 1 1	E—CAP 35R10uF	211420Q	R704		1 1 1	RES 3.9kohm 5% 1/4W	328392J
C704		1 1 1	E—CAP 35R10uF	211420Q	R705		1 1 1	RES 5.6kohm 5% 1/4W	328562J
C705		1 1 1	E—CAP 50R100uF	211530Q	R706		1 1 1	RES 5.6Kohm 5% 1/4W	328562J
C706		1 1 1	E—CAP 50R100uF	211530Q	R707		1 1 1	RES 18kohm 5% 1/4W	328183J
C707		1 1 1	E—CAP 16R100uF	211230Q	R708		1 1 1	RES 18kohm 5% 1/4W	328183J
C708		1 1 1	E—CAP 16R100uF	211230Q	R709		1 1 1	RES 1.8kohm 5% 1/4W	328182J
C709		1 1 1	E—CAP 6.3R220uF	211032Q	R710		1 1 1	RES 1.8kohm 5% 1/4W	328182J
C710		1 1 1	E—CAP 6.3R220uF	211032Q	R711		1 1 1	RES 1.8kohm 5% 1/4W	328182J
C711		1 1 1	C—CAP 15pF 10% 50V SL	232150K	R712		1 1 1	RES 1.8kohm 5% 1/4W	328182J
C712		1 1 1	C—CAP 15pF 10% 50V SL	232150K	R713		1 1 1	RES 4.7kohm 5% 1/4W	328472J
C713		1 1 1	M—CAP 0.001uF 10% 50V	222102K	R714		1 1 1	RES 4.7kohm 5% 1/4W	328472J
C714		1 1 1	M—CAP 0.001uF 10% 50V	222102K	R715		1 1 1	RES 10kohm 5% 1/4W	328103J
C715		1 1 1	C—CAP 6pF ±0.5pF 50V SL	232609D	R716		1 1 1	RES 10kohm 5% 1/4W	328103J
C716		1 1 1	C—CAP 6pF ±0.5pF 50V SL	232609D	R717		1 1 1	RES 150ohm 5% 1/4W	328151J
C717		1 1 1	M—CAP 0.1uF 10% 50V	222104K	R718		1 1 1	RES 150ohm 5% 1/4W	328151J
C718		1 1 1	M—CAP 0.1uF 10% 50V	222104K	R719		1 1 1	RES 47ohm 5% 1/4W	328470J
C719		1 1 1	C—CAP 3pF ±0.5pF 50V SL	232309D	R720		1 1 1	RES 47ohm 5% 1/4W	328470J
C720		1 1 1	C—CAP 3pF ±0.5pF 50V SL	232309D	R721		1 1 1	FP-MO-RES 100ohm 5% 1/2W	360101L
D701		1 1 1	DIODE 1S2076	501019S	R722		1 1 1	FP-MO-RES 100ohm 5% 1/2W	360101L
D702		1 1 1	DIODE 1S2076	501019S	R723		1 1 1	RES 33kohm 5% 1/4W	328333J
D703		1 1 1	DIODE 1S2076	501019S	R724		1 1 1	RES 33kohm 5% 1/4W	328333J
D704		1 1 1	DIODE 1S2076	501019S	R725		1 1 1	RES 68kohm 5% 1/4W	328683J
D705		1 1 1	DIODE 1S2076	501019S	R726		1 1 1	RES 68kohm 5% 1/4W	328683J
D706		1 1 1	DIODE 1S2076	501019S	R727		1 1 1	RES 1kohm 5% 1/4W	328102J
D707		1 1 1	DIODE 1S2076	501019S	R728		1 1 1	RES 1kohm 5% 1/4W	328102J
D708		1 1 1	DIODE 1S2076	501019S	R729		1 1 1	HVR EVL-S6A-A00-B52 500ohm—potentiometer	4300700
F2		1 1 —	FUSE 5A 250V MGC	4700540	R730		1 1 1	HVR EVL-S6A-A00-B52 500ohm—potentiometer	4300700
F3		1 1 —	FUSE 5A 250V MGC	4700540	R731		1 1 1	RES 100ohm 5% 1/4W	328101J
		4 4 —	FUSE HOLDER	7050420	R732		1 1 1	RES 100ohm 5% 1/4W	328101J
F2		— — 1	MIDGET FUSE		R733		1 1 1	RES 680ohm 5% 1/4W	328681J
F3		— — 1	MIDGET FUSE		R734		1 1 1	RES 680ohm 5% 1/4W	328681J
		— — 4	MIDGET FUSE HOLDER	7050430	R735		1 1 1	RES 680ohm 5% 1/4W	328681J
L1		1 1 1	CHOKE COIL	1210830	R736		1 1 1	RES 680ohm 5% 1/4W	328681J
L2		1 1 1	CHOKE COIL	1210830	R737		1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
Q701		1 1 1	TR 2SA798 (F,G)	514086S	R738		1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
Q702		1 1 1	TR 2SA798 (F,G)	514086S	R739		1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
Q703		1 1 1	TR 2SB646A (C,D)	510052S	R740		1 1 1	FP-MO-RES 2.7kohm 5% 1/2W	360272L
Q704		1 1 1	TR 2SB646A (C,D)	510052S	R741		1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
Q705		1 1 1	TR 2SC1345 (E)	511027S	R742		1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
Q706		1 1 1	TR 2SC1345 (E)	511027S	R743		1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
Q707		1 1 1	TR 2SD666A (C,D)	511025S	R744		1 1 1	FP-MO-RES 220ohm 5% 1/2W	360221L
Q708		1 1 1	TR 2SD666A (C,D)	511025S	R745		1 1 1	CEM-RES 0.47ohm 5W	384479W
Q709		1 1 1	TR 2SC1345 (E)	511027S	R746		1 1 1	CEM-RES 0.47ohm 5W	394479W
Q710		1 1 1	TR 2SC1345 (E)	511027S	R747		1 1 1	CEM-RES 0.47ohm 5W	384479W
Q711		1 1 1	TR 2SA844 (D,E)	510051S	R748		1 1 1	CEM-RES 0.47ohm 5W	384479W
Q712		1 1 1	TR 2SA844 (D,E)	510051S	R749		1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
Q713		1 1 1	TR 2SD667A (C,D)	511026S	R750		1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
Q714		1 1 1	TR 2SD667A (C,D)	511026S	R751		1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
Q715		1 1 1	TR 2SB647A (C,D)	511053S	R752		1 1 1	FP-MO-RES 10ohm 5% 2W	362100L
Q716		1 1 1	TR 2SB647A (C,D)	511053S	R753		1 1 1	FP-MO-RES 330ohm 5% 2W	362331L
Q717		1 1 1	TR 2SD388 (R,S)	513041S	R754		1 1 1	FP-MO-RES 330ohm 5% 2W	362331L
Q718		1 1 1	TR 2SD388 (R,S)	513041S	ZD701		1 1 1	ZENER DIODE HZ24	502040S
Q719		1 1 1	TR 2SB541 (R,S)	513053S	ZD702		1 1 1	ZENER DIODE HZ24	502040S
Q720		1 1 1	TR 2SB541 (R,S)	513053S			1 1 1	HEATSINK (EX)	7081840
							1 1 1	HEATSINK (B)	7081860
							1 1 1	HEATSINK (F)	7081960
							1 1 1	HEATSINK (S)	7081970
							8 8 8	PTS 3 ϕ x 8—screw	814308S
							8 8 8	PMS 3 ϕ x 14—screw	810314S
							8 8 8	TW(I) 3 ϕ —washer	893403U
							8 8 8	TW(I) 3 ϕ —washer	893403U
							8 8 8	IN 3 ϕ —nut	892013S

PART ORDERING PROCEDURE Include in any order: A. Part number, B. Part description, C. Model number.
(any of the above lacking from an order may delay shipment of that order.)

KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.	KEY NO.	SYMBOL NO.	TYPE ⁺ W-type-u E-type-u N-type-d	DESCRIPTION ⁺⁺	PART NO.
★706		1 1 1	EAR JACK HLJ 0190	4550220		C822	1 1 1	E-CAP 16R220uF	211232Q
						C823	1 1 1	E-CAP 35R4.7uF	211415Q
						C824	1 1 1	E-CAP 35R220uF	211432Q
			(POWER SUPPLY SECTION)			D802	1 1 1	DIODE 1S1885	560032S
						D803	1 1 1	DIODE 1S2076A	501020S
	C801	1 1 1	C-CAP 0.01uF 100,-0% 500V	238103P		Q803	1 1 1	TR 2SA844 (D,E)	510051S
	C802	1 1 1	C-CAP 0.01uF 100,-0% 500V	238103P		Q804	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	C803	1 1 1	C-CAP 0.01uF 100,-0% 500V	238103P		Q805	1 1 1	TR 2SC945 (L) (P,Q)	515077S
	C804	1 1 1	C-CAP 0.01uF 100,-0% 500V	238103P		Q806	1 1 1	TR 2SC1627 (O,Y)	511017S
	C805	1 1 1	E-CAP 50L3300uF	212543P					
	C806	1 1 1	E-CAP 50L3300uF	212543P		R813	1 1 1	RES 22kohm 5% 1/4W	328223J
	C807	1 1 1	E-CAP 50L3300uF	212543P		R814	1 1 1	RES 22kohm 5% 1/4W	328223J
	C808	1 1 1	E-CAP 50L3300uF	212543P		R815	1 1 1	RES 18kohm 5% 1/4W	328183J
	C809	1 1 1	E-CAP 50L3300uF	212543P		R816	1 1 1	RES 18kohm 5% 1/4W	328183J
	C810	1 1 1	E-CAP 50L3300uF	212543P		R817	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	C811	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R818	1 1 1	RES 2.2kohm 5% 1/4W	328222J
	C812	1 1 1	M-CAP 0.1uF 10% 50V	222104K		R819	1 1 1	RES 220kohm 5% 1/4W	328224J
	C813	1 1 1	E-CAP 35R330uF	211433Q		R820	1 1 1	RES 12kohm 5% 1/4W	328123J
	C814	1 1 1	E-CAP 35R330uF	211433Q		R821	1 1 1	RES 100kohm 5% 1/4W	328104J
	C815	1 1 1	E-CAP 35R47uF	211425Q		R822	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
	C816	1 1 1	E-CAP 35R47uF	211425Q		R823	1 1 1	FP-MO-RES 220ohm 5% 1W	361221L
	C817	1 1 1	E-CAP 35R47uF	211425Q					
	C818	1 1 1	E-CAP 35R47uF	211425Q			1 1 1	RELAY MAT4B-211R(DC24V)	1700210
	C819	1 1 1	M-CAP 0.1uF 10% 50V	222104K					
	C820	1 1 1	M-CAP 0.1uF 10% 50V	222104K					
	D801	1 1 1	DIODE S5VB10	560041S					
	↑	1 1 1	HEATSINK (D)	7081950					
	↑	1 1 1	PTS 3 φ x 12—screw	814312S					
	Q801	1 1 1	TR 2SD571 (L,M)	511012S					
	Q802	1 1 1	TR 2SB605 (L,M)	510041S					
	F1	1 1 —	FUSE 2A AC125V	4700660					
		2 2 —	FUSE HOLDER	7050420					
	F1	— — 1	MIDGET FUSE 2A		★800	1 1 1		METER CONTROL PCB ASS— complete circuit board	9492350
		— — 2	MIDGET FUSE HOLDER	7050430					
	R801	1 1 1	FP-MO-RES 4.7kohm 5% 2W	362472L					
	R802	1 1 1	FP-MO-RES 4.7kohm 5% 2W	362472L		D901	1 1 1	DIODE 1N60P	500001G
	R803	1 1 1	FP-MO-RES 100ohm 5% 1W	361101L		D902	1 1 1	DIODE 1N60P	500001G
	R804	1 1 1	RES 4.7kohm 5% 1/4W	328472J		D903	1 1 1	DIODE 1S2076	501019S
	R805	1 1 1	RES 4.7kohm 5% 1/4W	328472J		D904	1 1 1	DIODE 1S2076	501019S
	R806	1 1 1	FP-MO-RES 100ohm 5% 1W	361101L		D905	1 1 1	DIODE 1S2076	501019S
	R807	1 1 1	RES 100ohm 5% 1/4W	328101J		D906	1 1 1	DIODE 1S2076	501019S
	R808	1 1 1	RES 100ohm 5% 1/4W	328101J					
	R809	1 1 1	RES 47ohm 5% 1/4W	328470J	★801	R913,			
	R810	1 1 1	RES 47ohm 5% 1/4W	328470J		R914	1 1 1	VR,V16L4G3-1PHN25KC, B5kohmX2(meter level)	4320670
	R811	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L		R915	1 1 1	HVR, EVL-S6A-A00-B14, B10kohm —potentiometer	4300650
	R812	1 1 1	FP-MO-RES 2.2kohm 5% 1W	361222L		R916	1 1 1	HVR, EVL-S6A-A00-V14,B10kohm —potentiometer	4300650
	ZD801	1 1 1	ZENER DIODE HZ33	502039S		R917	1 1 1	RES 680ohm 5% 1/4W	328681J
	ZD802	1 1 1	ZENER DIODE HZ33	502039S		R918	1 1 1	RES 680ohm 5% 1/4W	328681J
			(PROTECTOR SECTION)			R919	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm —potentiometer	4300700
	C821	1 1 1	E-CAP 16R220uF	211232Q		R920	1 1 1	HVR, EVL-S6A-A00-B52, B500ohm —potentiometer	4300700

ALIGNMENT

TEST EQUIPMENT

Allow a minimum of 10 minutes warm-up for test equipment and the amplifier to be tested.

Maintain rated line voltage.

Generator—Audio Frequency

DC Voltmeter—High Sensitivity

Vacuum Tube Voltmeter

(Oscilloscope)

Connect 8 ohm dummy loads to both L and R channel speaker terminals of the amplifier.

MIDPOINT VOLTAGE

(See Tone/Main Amp Circuit Board)

Left Channel: Apply no signal to the amplifier input. Using DC Voltmeter, see that the voltage drop across the dummy load is 0 ± 20 millivolts.

Right Channel: The same procedure as the left channel.

IDLING CURRENT ADJUSTMENT

(See Tone/Main Amp Circuit Board)

Left Channel. Apply no signal to the amplifier input.

Using DC Voltmeter, adjust potentiometer R729 so that the voltage drop at TP35 to TP36 is 9.4 (or 4.7 to 18.8) millivolts.

Right Channel. Similarly, adjust potentiometer R730 so that the voltage drop at TP37 to TP38 is 9.4 (or 4.7 to 18.8) millivolts.

METER LEVEL ADJUSTMENT

(See Meter Control Circuit Board)

Connect Generator to "AUX" of the amplifier.

Set potentiometers R915, R916, R919 and R920 to mid-range.

Left Channel:

1. Set "METER LEVEL" fully clockwise. Set Generator and "VOLUME" to obtain 1.5 watts power output. Adjust potentiometer R915 so that power meter reads 0dB.
2. Set "METER LEVEL" fully counter-clockwise. Set Generator and "VOLUME" to obtain 60 watts power output. Adjust potentiometer R919 so that the power meter reads 0dB.
3. Repeat steps 1 and 2 two or three times.

Right Channel:

1. Set "METER LEVEL" fully clockwise. Set Generator and "VOLUME" to obtain 1.5 watts power output. Adjust potentiometer R916 so that power meter reads 0dB.
2. Set "METER LEVEL" fully counter-clockwise. Set Generator and "VOLUME" to obtain 60 watts power output. Adjust potentiometer R920 so that the power meter reads 0dB.
3. Repeat steps 1 and 2 two or three times.

SEMICONDUCTOR DATA

TRANSISTORS

+ NOTES
Ge : Germanium
Si : Silicon
A : Alloy
B : Base
D : Diffused
Dd : Double-diffused
Df : Drift-field
E : Epitaxial
G : Grown
J : Junction
M : Mesa
P : Planar
Pc : Point-contact
Td : Triple-diffused

DEVICE TYPE	APPLICATIONS	STRUC- TURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)					ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)													MANU- FACTURE		
			Collector- to-Base Voltage VCBO	Emitter- to-Base Voltage VEBO	Collector Current IC	Collector Dissipa- tion PC	Junction Tempera- ture Tj	Collector Cutoff Current	Static Forward-Current Transfer Ratio			Collector-Emitter Saturation Voltage			Gain-Bandwidth Product			Base Spreading Resistance				Output Capaci- tance Cob	
			(V)	(V)	(mA)	(mW)	(C)	ICBO (uA)	VCB (V)	hFE	VCE (V)	IC (mA)	VCE(sat) (V)	IC (mA)	IB (mA)	fT ωb* (MHz)	VCE VCB* (V)	IE IC* (mA)	γbb' hie(real)* (Ω)	VCE VCB* (V)		IE (mA)	(pF)
2SA798(F,G)	AF	PNP Dual Si-EP	-70	-5	-100	200	125	-0.1	-35	250 800	-6	-1	-0.6 max	-10	-1	100	-6	1				3	MITSUBISHI
2SA836(E)	AF,Low noise	PNP Si-E	-55	-5	-100	200	125	-0.1	-18	400 800	-12	-2	-0.5 max	-10	-1	200	-12	2				1.8	HITACHI
2SA844(D,E)	AF,Power	PNP Si-E	-55	-5	-100	300	125	-0.1	-18	250 800	-12	-2	-0.5 max	-10	-1	200	-12	2				1.8	HITACHI
2SB541(R,S)	AF	PNP Si-TdM	-110	-6	-8A	80W (Tc=25 C)	150	-100	-100	40 120	-5	-1A	2 max	-5	-1	7	-10	200				320	NEC
2SB646A(C,D)	AF,Pridriver	PNP Si-E	-120	-5	-50	900	150	-10	-100	60 320	-5	-10	-2 max	-30	-3	140	-10	10				4	HITACHI
2SB647(C,D)	AF,Driver	PNP Si-E	-120	-5	-1A	900	150	-10	-100	60 320	-5	-150	-1 max	-500	-50	140	-5	10				20	HITACHI
2SB605(L,M)	AF,Driver	PNP Si-E	-60	-5	-700	800	150	-0.1 max	-60	90 270	-1	-100	-0.6 max	-500	-50	120	-6	10					NEC
2SC945 L (P,Q)	AF,Low noise general	NPN Si-E	60	5	100	250	125	100	60	135 400	6	1	0.15 0.5	100	10	250	6	-10				3.5	NEC
2SC1345 (E)	AF,Low noise	NPN Si-E,LTP	55	5	100	200	125	0.5 max	18	400 800	12	2	0.5 max	10	1	230	12	-2				1.8	HITACHI
2SC1627(O,Y)	AF,Voltage amp., Driver	NPN Si-E	80	5	300	600	150	0.1	50	70 240	12	50	0.5	200	10	100	10	-10				10	TOSHIBA
2SD388(R,S)	AF,Power	NPN Si-TdM	150	100	8A	80W (Tc=25 C)	150	100	100	40 120	5	1A	2max 0.6	5	1	9	10	-200				190	NEC
2SD571(L,M)	AF,Driver	NPN Si-E	60	5	700	800	150	0.1 max	60	90 270	1	100	max	500	50	110	6	-10					NEC
2SD666A(C,D)	AF,Pridriver	NPN Si-E	120	5	50	900	150	10	100	60 320	5	10	2max	30	3	140	10	10*				3	HITACHI
2SD667A (C,D)	AF,Driver AF,Driver	NPN- Si-E	120	5	1A	900	150	10	100	60 320	5	150	1max	500	50	140	5	150*				12	HITACHI

FIELD EFFECT TRANSISTORS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)						ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)														MANUFACTURE		
			Gate-to-Drain Voltage	Gate-to-Source Voltage	Gate Current	Drain Current	Total Power Dissipation	Junction Temperature	Gate Leak Current		Gate to Drain Breakdown Voltage		Drain Current		Gate to Source Cutoff Voltage		Forward Transfer Admittance		Feed back Capacitance		Power Gain (Common source)			Noise Figure	
			VGDO	BGSO	IG	ID	Tj	Tj	Test Conditions	IGSS	Test Conditions	V(BR) GDO	Test Conditions	IDSS	Test Conditions	VGS	Test Conditions	yfs	Test Conditions	CRSS	Test Conditions	GPS		Test Conditions	NF
			(V)	(V)	(mA)	(mA)	(mW)	(°C)		(nA)		(V)		(mA)		(V)		(μfs)		(pF)		(dB)			(dB)
2SK68A (L,M)	AF, Low noise	N-channel Junction FET	-50	-50	10	20	250	125	VGS= -20V VDS= 0	-1.0 max		VDS= 10V VGS= 0	0.5 min 3.0 typ 12 max	VDS= 10V ID= 10μA	-0.5	VDS= 10V ID= 0.5mA f=1KHz	5.2	VDS= 10V VGS= 0 f=1MHz	2.6			VDS= 10V VGS= 0 RG= 1Kohm	10 max (10Hz) 1.5 max (1KHz)	NEC	

DIODES, LEDS

DEVICE TYPE	APPLICATIONS	STRUCTURE†	MAXIMUM RATINGS Absolute-Maximum Values: (TA = 25°C unless otherwise specified)							ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25°C unless otherwise specified)										MANUFACTURE
			Reverse Surge Voltage	Peak Reverse Voltage	Reverse Voltage	Peak Forward Voltage	Peak Forward Current	Average Rectified Current	Forward Surge Current	Junction Temperature	Total Power Dissipation	Forward Current	Forward Voltage	Reverse Current	Test Condition	Test Condition	Test Condition	Test Condition	Test Condition	
			VR surge (V)	VRM (V)	VR (V)	VFM (V)	IFM (mA)	I (mA)	IF surge (A)	Tj (°C)	PD (mW)	IF min (mA)	VF (V)	IR max (μA)	VF (V)	IF (mA)	IR (μA)	VR (V)	VR (V)	
S5VB10	Rectifier			-100					200 (Tc=25°C)	150						1.05	3A	10		SHINDENGEN
1N60P	FM detector	Ge-P		-35	-25	500	150	IF = 50	0.5 (1 sec)	70		4	1				75	-10		HITACHI
1S1885	Rectifier	Si-A		-100		70		1A (Ta=65°C)	60						1.2	1.5A	10	-100		TOSHIBA
	Various detector, Modulator, Demodulator	Si-EP		-35	-30		450	150	1	175	250				0.8	10	1	-30		HITACHI
1S2076	Various detector, Modulator, Demodulator	Si-EP		-35	-30		450	150	1	175	250				0.8	10	1	-30		HITACHI

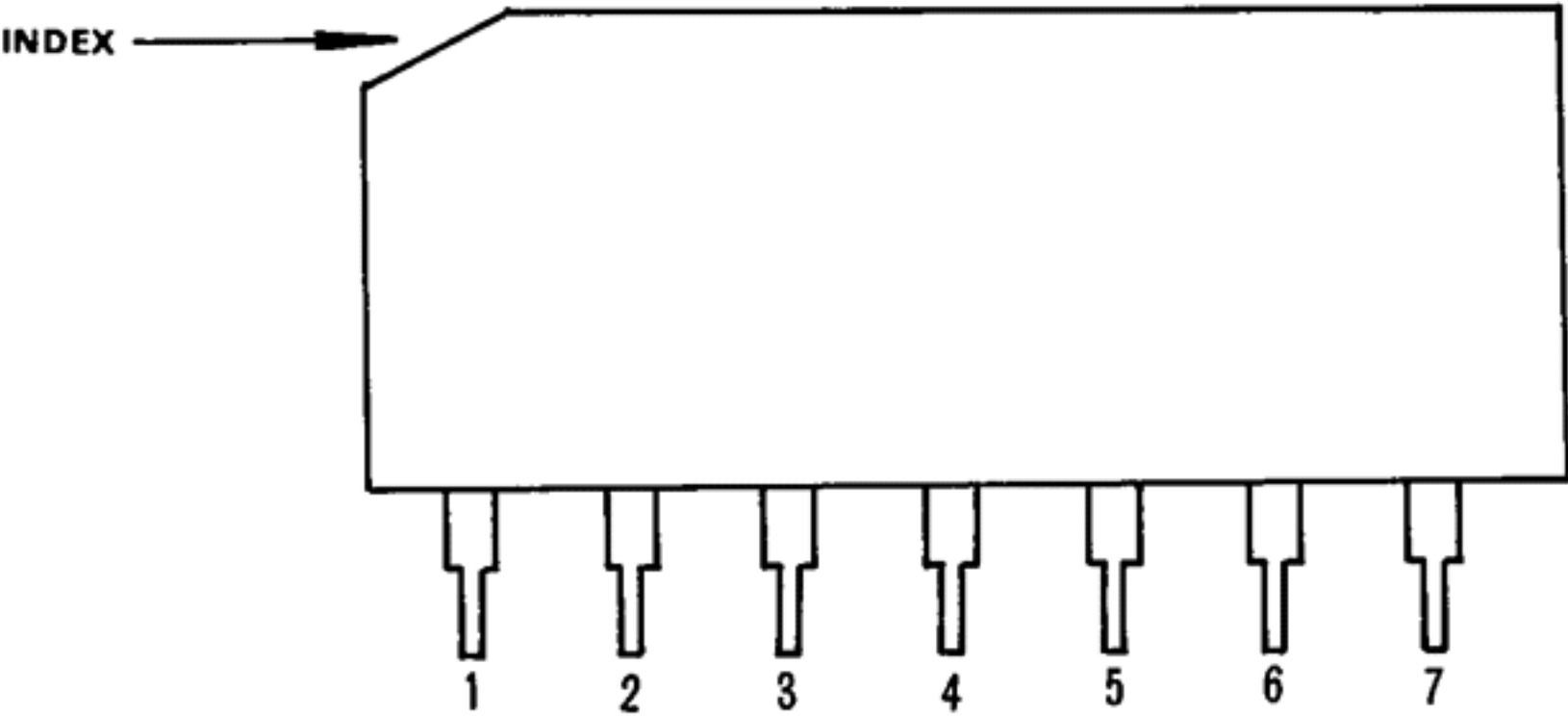
ZENER DIODES

DEVICE TYPE	APPLICATIONS	STRUC- TURE†	MAXIMUM RATINGS Absolute —Maximum Values: (TA = 25 °C unless otherwise specified)			ELECTRICAL CHARACTERISTICS Typical Values: (TA = 25° C unless otherwise specified)													MANUFACTURE
			Total Power Dissipa- tion PD (mW)	Zener Current IZ (A)	Junction Tempera- ture Tj Tj (C)	Zener Voltage			Test Condi- tion	Differential Resistance		Temperature Coefficient		Test Condi- tion	Reverse Current				
						VZ				rd	γZ	IR	Test Condi- tion						
						MIN (V)	TYP (V)	MAX (V)	IZ (mA)					TYP (Ω)	MAX (Ω)	IZ (mA)	TYP (%/ C)	MAX (%/ C)	
HZ24	Stabilized power supply	Si—EP	400		175	—22.8	—23.6	—25.6	—2	62	70	—2		20.3 mV/ C	—2	1	—19	HITACHI	
HZ33	Stabilized power supply	Si—EP	400		175	—31.0	—32.8	—35.0	—2	79	120	—2		30.4 mB/ C	—2	1	—25	HITACHI	

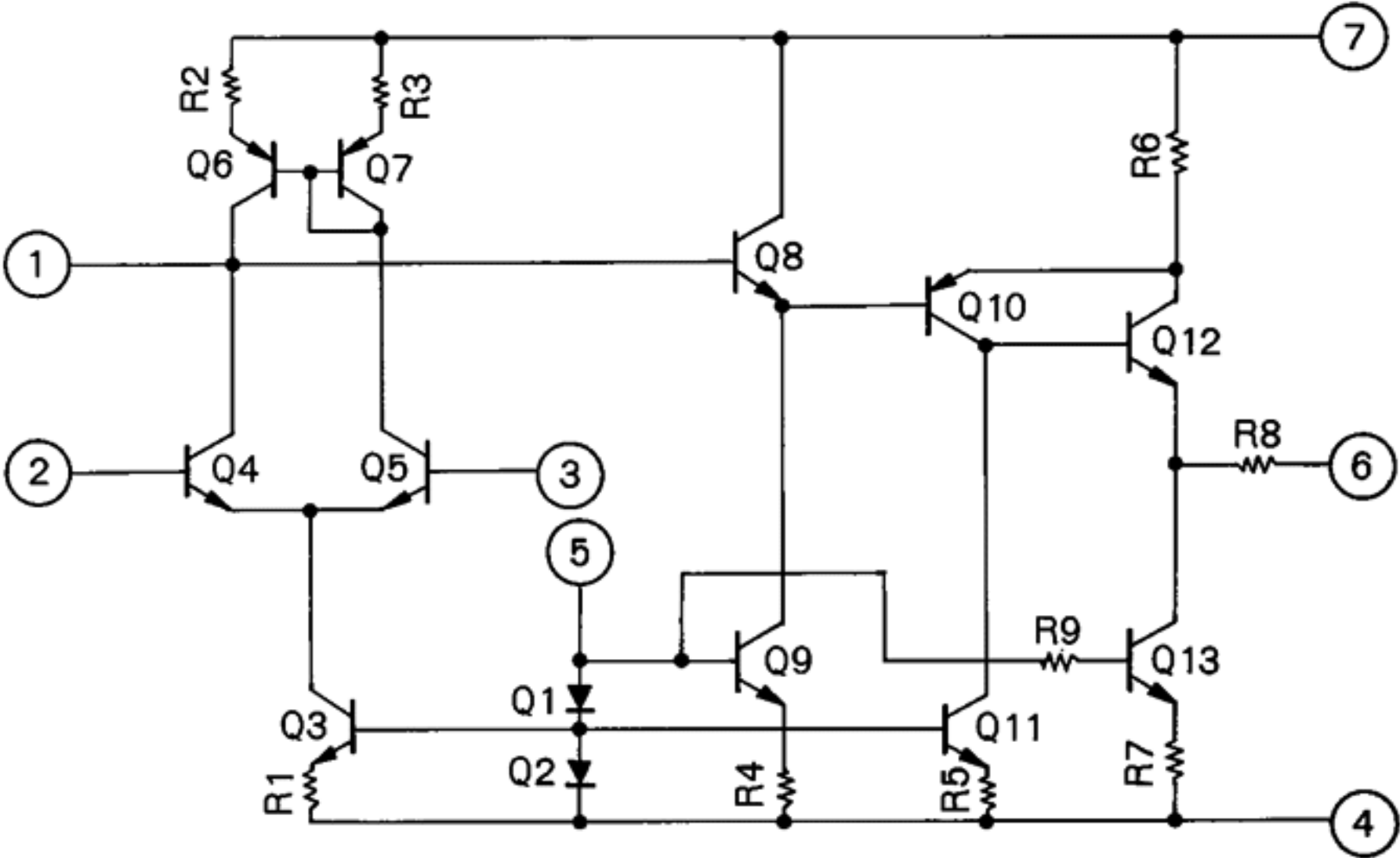
INTEGRATED CIRCUIT (TA7136P)

DEVICE TYPE	APPLICATION	ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C)				ELECTRICAL CHARACTERISTICS(T _A =25 °C) Typical Values				Manufacture
		Supply Voltage	Power Dissipation	Operating Temperature Range	Storage Temperature Range	Supply Current	Voltage Gain (Open Loop)	Maximum Output Voltage	Equivalent Input Noise Voltage	
		(V)	(mW)	(° C)	(° C)	(mA)	(dB)	(Vrms)	(μ Vrms)	
TA7136P	Preamplifier	40	400	−25 75	−55 125	3.1	92	7.0	1.0	TOSHIBA

Terminal Guide (Side View)



Schematic Diagram



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